REMARKS

In the Office Action mailed January 6, 2005, claims 1, 2 and 11 were rejected under 35 U.S.C. § 102(b) as being anticipated by Aduddell (U.S. Patent No. 5,436,612).

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell in view of Kyrtsos (U.S. Patent No. 6,072,388).

Claims 5-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell and Kyrtsos and in view of Magiawala, et al. (U.S. Patent No. 6,278,361).

Claims 12, 14, 20 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell in view of Kyrtsos .

Claims 13 and 15-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell and Kyrtsos and in view of Magiawala, et al..

Applicants respectfully traverse each of these rejections for the reasons that follow.

Claim Rejections – 35 U.S.C. § 102

Applicants respectfully traverse the § 102(b) rejection to claims 1, 2, and 11. Respectfully, Aduddell does not disclose a signal processing device that includes a neural network for receiving and processing a sound monitoring device output signal.

Aduddell discloses an audible vehicle monitoring apparatus that seeks to provide for a single monitoring device capable of simultaneously monitoring tire recap conditions, wheel bearing conditions, and universal joint conditions (see Aduddell at column 2, lines 25-29; and the title of Aduddell). A sound monitoring assembly 12 is connected to the undercarriage 14 of a

wheeled vehicle 16 and includes a microphone assembly 24 for receiving sound (see Aduddell at column 7, lines 1-10). A wave transmitter 24 is also included in the sound monitoring assembly 12 and transmits waves representing sounds picked up by the microphone assembly 24 (see Aduddell at column 7, lines 14-17). An audible signaling assembly 18 is located in a cab portion 20 of the motor vehicle in which the driver is located (see Aduddell at column 7, lines 21-22). A wave receiver assembly 32 is located in the signal housing assembly 30 and includes a wave receiving antenna that is adapted for receiving the transmitted waves from the wave transmitter assembly 28 (see Aduddell at column 7, lines 23-32). The audible signaling assembly 18 also includes a speaker assembly 36 that receives audio signals from the wave receiver assembly 32 and provides audible signals to the driver of the motor vehicle (see Aduddell at column 7, lines 32-38).

The audible vehicle monitoring apparatus of Aduddell therefore transmits the sounds heard by the sound monitoring assemblies 12 to the cab of the vehicle so that the driver can listen to the sound and notice a perceptible change in the sound to determine when tire recaps may loosen from the tire bodies or when universal joints begin to fail (see Aduddell at column 8, lines 19-32). The entire point of Aduddell is to enable the driver of the vehicle to be able to listen to the sounds produced at the undercarriage of the vehicle so as to determine with his or her trained ear whether a tire recap condition, wheel bearing condition, or a universal joint condition that indicates a problem in the vehicle is occurring. The electronics in Aduddell simply transmit sound from one location to the other and do not process any of the sounds so as to arrive at a particular conclusion. All of the processing of the sounds in the design of Aduddell comes

entirely from the **driver** of the vehicle.

Claim 1 of Applicants' application calls for a signal processing device that includes a neural network for receiving and processing the sound monitoring device output signal. As discussed in Applicants' application, a neural network may be an inductive program that learns a correct solution through example and as such may be capable of taking data with known outputs and then refining inner connected processors or nodes that interact with one another in order to arrive at a correct solution (see page 8, line 23 to page 9, line 20 of Applicants' application).

As such, the signal processing device 32 in Aduddell does not include a neural network because the signal processing device 32 simply transmits the sound from one location to another and does not work to arrive at a solution as to whether the tire is experiencing a potential damage condition upon processing of the information. The audible vehicle monitoring apparatus in Aduddell simply relays sound from one location to another and does not act in any way to actually process the sound so as to determine whether a tire is experiencing a potential damage condition.

Further, it would not have been obvious for one having ordinary skill in the art to modify Aduddell so as to arrive at the apparatus set forth in claim 1 of Applicants' application. The entire principle of operation of the invention in Aduddell to provide for a single monitoring and signaling device for monitoring tire recap conditions, wheel bearing conditions, and universal joint conditions that allows the driver of the motor vehicle to perceive changes in the sounds made by the wheel bearings and tires of the vehicle so as to note whether one of the aforementioned conditions is occurring (see Aduddell at column 2, lines 25-29 and column 8,

lines 16-29). Therefore, the entire principle of operation in Aduddell is to provide for an audible vehicle monitoring apparatus that allows the driver of the vehicle to determine through his or her trained ear whether a potential dangerous situation is occurring. Modifying the audible vehicle monitoring apparatus of Aduddell so that the apparatus includes a signal processing device with a neural network would entirely defeat the intended principle of operation in Aduddell because the determination of the aforementioned conditions would then be made by the apparatus itself instead of by the driver through his or her trained ear. If the proposed modification would change the principle of operation of the reference being modified, then the teachings of the reference are not sufficient to render the claims of Applicants' application *prima facie* obvious.

For these reasons, Applicants respectfully submit that claim 1, and its dependent claims 2 and 11, define over Aduddell and are in condition for allowance. Applicants respectfully request that the Examiner remove this rejection.

Claim Rejections – 35 U.S.C. § 103

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell in view of Kyrtsos (U.S. Patent No. 6,072,388). Claims 3 and 4 depend from claim 1. As stated above with regard to claim 1, Aduddell does not contain a neural network as required by claim 1. As to Kyrtsos, this reference is specifically directed towards a method of monitoring the drive line of a vehicle. Kyrtsos specifically defines the drive line as including the parts of the vehicle that connect the transmission to the driving axles of the vehicle - which does not include tires (see Kyrtsos at column 2, lines 39-41). As such, Kyrtsos does not monitor for a potential

damage condition of a tire as required by claims 3 and 4.

Further, if a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. Aduddell is directed towards monitoring by way of a trained ear of a driver while Kyrtsos uses a control 26 to detect problems in a drive line. Therefore, the principle of operation of the two references is completely opposite from one another. Incorporation of Kyrtsos into Aduddell would completely change the principle of operation in Aduddell because the resulting device would not function so as to allow the driver to audibly monitor for the aforementioned conditions.

Finally, the only suggestion or motivation provided by the Examiner for combining Aduddell and Kyrtsos is "to improve the accuracy of the apparatus by eliminating sound recorded from other sources." First, the Examiner has assumed that such a problem exists – no such problem is indicated by Aduddell and Kyrtsos. Each are directed at other problems. Second, there is no teaching in either reference that would suggest that accuracy would be improved by such a combination. In fact, Kyrtsos specifically teaches that the driver can accurately make such determinations. See Col. 8, lines 19-25. Thus, even if Aduddell and Kyrtsos could be combined, there is no such suggestion or motivation provided by the Examiner.

For these reasons, Applicants respectfully submit that claims 3 and 4 are in condition for allowance. Applicants respectfully request that the Examiner remove this rejection.

Claims 5-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell and Kyrtsos and in view of Magiawala, et al. (U.S. Patent No. 6,278,361). However, as already set forth above with regard to claims 3 and 4, it is respectfully submitted that Aduddell does not contain a neural network as required by claims 5-10, Kyrtsos does not monitor for a potential damage condition of a tire as required by claims 5-10, incorporation of Kyrtsos into Aduddell would completely change the principle of operation in Aduddell because the resulting device would not function so as to allow the driver to audibly monitor for the aforementioned condition, and the Examiner has cited no suggestion or motivation to combine Kyrtsos and Aduddell.

The addition of Magiawala et el. does not overcome any of these shortcomings. Magiawala et el. is directed to tread wear, shock absorber performance, balance condition, and rotation speed (Col. 1, lines 33-44) – but nowhere discloses an output signal based on potential damage condition of the tire as required by claims 5-10. Similarly, claims 5-10 requires at least one sound monitoring device. Magiawala, et al. does not disclose a sound monitoring device as is expressly required by claims 5-10. Instead, Magiawala, et al. employs signal processing circuits that obtain information from a radio accelerometer 2, a lateral accelerometer 4, and temperature and pressure sensors 6 (see Magiawala, et al. at Col. 3, l. 45 to Col. 4, l. 4). Finally, claims 5-10 require a sound monitoring device mountable on a vehicle. Magiawala et al. requires that the sensors are mounted either inside the tire or on the wheel rim. See Col. 3, lines 46-49. Such a location is required because Magiawala et al. is using sensors that measure lateral and/or radial acceleration of the tire itself. Mounting the sensors of Magiawala et al. on the vehicle itself would destroy the principle of operation of Magiawala et al. and prevent it from functioning

properly.

For these reasons, Applicants respectfully submit that claims 5-10 are in condition for allowance. Applicants respectfully request that the Examiner remove this rejection.

Claims 12, 14 and 20-21 were under 35 U.S.C. § 103(a) as being unpatentable over Aduddell in view of Kyrtsos. For reasons already stated, it is respectfully submitted that the rejections based on this combination should be withdrawn. More specifically, it is respectfully submitted that Aduddell does not contain a neural network, incorporation of Kyrtsos into Aduddell would completely change the principle of operation in Aduddell because the resulting device would not function so as to allow the driver to audibly monitor for the aforementioned condition, and the Examiner has cited no suggestion or motivation to combine Kyrtsos and Aduddell.

Furthermore, claims 12, 14, and 20-21 each call for an apparatus capable of indicating to a user of the vehicle that the tire is experiencing some amount of tread belt separation. The combination of Aduddell and Kyrtsos does not result in an apparatus that is capable of detecting tread belt separation because both of these references completely lack any mention of tread belt separation. Aduddell is directed towards an audible vehicle monitoring apparatus capable of detecting a defective tire recap condition, wheel bearing condition, or universal joint condition (see Aduddell at column 2, lines 25-29). Aduddell does not disclose an audible vehicle monitoring apparatus for measuring tread belt separation. Likewise, Kyrtsos is not directed towards an apparatus for measuring tread belt separation. Kyrtsos is specifically directed towards a method of monitoring the drive line of a vehicle. Kyrtsos specifically defines the drive

line as including the parts of the vehicle that connect the transmission to the driving axels of the vehicle (see Kyrtsos at column 2, lines 39-41).

Therefore, even if Aduddell and Kyrtsos were combined with one another, the resulting device would still not include an apparatus capable of indicating to a user of a vehicle that a tire is experiencing tread belt separation. A *prima facie* case of obviousness cannot be maintained because the combination of references does not disclose all of the claim elements of claims 12, 14, and 20-21 of the present application. The Examiner is respectfully requested to remove this rejection.

Finally, claims 13 and 15-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aduddell and Kyrtsos as applied to claim 12 and in view of Magiawala et al. However, as previously described above with regard to claim 12, , it is respectfully submitted that the rejections based on this combination should be withdrawn. More specifically, it is respectfully submitted that Aduddell does not contain a neural network, incorporation of Kyrtsos into Aduddell would completely change the principle of operation in Aduddell because the resulting device would not function so as to allow the driver to audibly monitor for the aforementioned condition, and the Examiner has cited no suggestion or motivation to combine Kyrtsos and Aduddell. In addition, as described above, although required by claims 13 and 15-19, even if Aduddell and Kyrtsos were combined with one another, the resulting device would still not include an apparatus capable of indicating to a user of a vehicle that a tire is experiencing tread belt separation.

The addition of Magiawala et el. does not overcome any of these shortcomings.

Magiawala et el. is directed to tread wear, shock absorber performance, balance condition, and rotation speed (Col. 1, lines 33-44) – but nowhere discloses an output signal based on tread belt separation as required by claims 13 and 15-19. Similarly, these same claims require at least one sound monitoring device. Magiawala, et al. does not disclose a sound monitoring device as is expressly required by claims 13 and 15-19. Instead, Magiawala, et al. employs signal processing circuits that obtain information from a radio accelerometer 2, a lateral accelerometer 4, and temperature and pressure sensors 6 (see Magiawala, et al. at Col. 3, l. 45 to Col. 4, l. 4). Finally, claims 5-10 require a sound monitoring device mountable on a vehicle. Magiawala et al. requires that the sensors are mounted either inside the tire or on the wheel rim. See Col. 3, lines 46-49. Such a location is required because Magiawala et al. is using sensors that measure lateral and/or radial acceleration of the tire itself. Mounting the sensors of Magiawala et al. on the vehicle itself would destroy the principle of operation of Magiawala et al. and prevent it from functioning properly.

For these reasons, Applicants respectfully submit that claims 13 and 15-19 are in condition for allowance. Applicants respectfully request that the Examiner remove this rejection.

Applicants respectfully submit that claims 1-21 are allowable and that the application is in condition for allowance. Favorable reconsideration and action thereon is respectfully requested. The Examiner is encouraged to contact the undersigned at the Examiner's

convenience should the Examiner have any questions concerning this matter or require any additional information.

Respectfully submitted,

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March 8, 2005
Date

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